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? TITLE: Development of a Q-band Propagation Campaign in the United States

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? ABSTRACT: The imminent saturation of commercial Ka-band services has generated increased interest by the SATCOM industry, as well as NASA (via potential commercially provided SATCOM services), to investigate the use of the Q-band (37-42 GHz) for future space-to-earth communications spectrum utilization. It is well understood that the use of higher frequencies (i.e., Q-band) offers wider bandwidth, higher data rate services, but an understanding of Q-band performance limitations as they pertain to atmospheric propagation, particularly at NASA and commercial sites of interest, is not well characterized. Thus, the first steps towards system performance determination will be the initiation of a propagation campaign to statistically The imminent saturation of commercial Ka-band services has generated increased interest by the SATCOM industry, as well as NASA (via potential commercially provided SATCOM services), to investigate the use of the Q-band (37-42 GHz) for future space-to-earth communications spectrum utilization. It is well understood that the use of higher frequencies (i.e., Q-band) offers wider bandwidth, higher data rate services, but an understanding of Q-band performance limitations as they pertain to atmospheric propagation, particularly at NASA and commercial sites of interest, is not well characterized. Thus, the first steps towards system performance determination will be the initiation of a propagation campaign to statistically quantify long-term degradation parameters due to the atmosphere. As such, NASA Glenn Research Center (GRC), in collaboration with Space Systems/Loral (SS/L), is leading an effort to characterize Q-band link performance at key sites to determine its potential for use in future space communications architectures. The proposed propagation campaign is divided into phases, beginning with passive radiometric observations in the Q-band, and eventually leading to an active beacon experiment. Herein, we describe the schedule, development, and architecture of the first Q-band propagation campaign being conducted in the US and the proposed objectives of the effort.

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